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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/750,125	12/29/2000	Mitsuhiro Kanada	Q62454	6746

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EXAMINER

CHANG, VICTOR S

ART UNIT	PAPER NUMBER
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1771

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DATE MAILED: 06/21/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/750,125

Applicant(s)

KANADA ET AL.

Examiner

Victor S Chang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2, 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 1-3, the phrase "high pressure" is unduly vague and indefinite.

Clarification is requested regarding the minimum and maximum pressure of the "high pressure".

In claim 10, line 3, the unit of the relative density is not specified.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 99/47573 either individually, or in view of admitted prior art for claim 2.

WO '573 is directed at a low-density microcellular thermoplastic elastomeric foams with closed cells. The foam is made using supercritical fluid CO<sub>2</sub> as the blowing

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agent (claims 1, 5-7) (Abstract). The polymer and the blowing agent are mixed in the melt stage in a tandem extruder under high temperature and pressure, subsequently the temperature and pressure are reduced to initiate foaming (page 3, lines 9-17).

Alternatively, the polymers and any optional fillers are first melt compounded in a Brabender or twin-screw extruder, then mixed with the blowing agent for foaming (claims 3-4) (page 3, lines 18-25). WO '573 also teaches that various foam properties such as the density, cell structure and size, compression set, etc. may be adjusted by varying the foaming conditions (page 5, lines 23-26), and it is noted that it is well known that CO<sub>2</sub> typically reaches supercritical fluid state under high pressure over 10 Mpa (claims 7-11). Further, WO '573 teaches that suitable thermoplastic elastomers include blends of polyolefins, polyurethanes, etc. (claim 12) (page 2, lines 23-28). It is noted that suitable polyurethanes are thermoplastic elastomers, and polyolefin is inherently a non-elastomeric thermoplastic polymer. Finally, Applicants seems to admit the prior art JP-A-322168 teaches the method of impregnating a pre-formed unexpanded thermoplastic molding (claim 2) (Specification, page 4, paragraph 2).

With respect to the product-by-process claims 1-3, Applicant must show that the resultant article is patentably distinct from those taught by the reference.

As such, in the absence of unexpected results, it would have been obvious to one of ordinary skill in the art to modify and optimize the processing conditions of WO '573, motivated by the desire to obtain microcellular foams viable for sound proofing application.

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5. Claims 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 99/47573 either individually, or in view of Nakae et al. (US 4353817).

The teachings of WO '573 are again relied upon as set forth above. It is noted that WO '573 lacks specific teaching of using hydrated metal compound as flame retardant. However, it is well known that hydrated metal compound is an effective flame retardant for polymer foams. Alternatively, Nakae's invention is related to polymer foams with high flame retardancy (Abstract). Nakae teaches that by adding hydrated metal compounds render the polymer foams highly flame retardant (column 2, lines 52 to column 3, line 11). Further, Nakae discloses that the hydrated metal oxide has a general structural formula  $M_mO_n \cdot XH_2O$ , for example, aluminum hydroxide ( $Al_2O_3 \cdot 3H_2O$  or  $Al(OH)_3$ ), magnesium hydroxide ( $MgO \cdot H_2O$  or  $Mg(OH)_2$ ), etc. (column 7, lines 21-37).

As such, in the absence of unexpected results, it would have been obvious to one of ordinary skill in the art to incorporate hydrated metal compound in the thermoplastic foams, as taught by Nakae, motivated by the desire to improve the flame retardancy of the foams made by the methods taught by WO '573.

6. Claims 1-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cha et al. (US 5158986).

Cha's invention is directed to a microcellular foamed material (abstract). Fig. 14 shows a process of impregnating an unexpanded plastic material with a supercritical fluid  $CO_2$  at a high pressure, then decompressed and reheated at a foaming station to induce foaming (Applicants' claims 1, 2, 4-6) (column 7, line 29 to column 8, line 2). Alternatively Fig. 15 shows the supercritical fluid is introduced into the molten polymer

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material in an extruder under high pressure, and then pressure is reduced in order to initiate foaming (claims 1, 3, 4-6) (column 8, lines 12-46). Cha shows examples of PVC and polycarbonate foams made from fluid/polymer system at a pressure of 1500 psi (10.2 MPa) (claim 7) (column 6 lines 19-22, and column 6, lines 61-64). Cha discloses that the PVC foam achieves a cell density of about  $2 \times 10^{12}$  cells/cc and an average cell size of about 0.8 microns (claims 8, 9) (column 5, lines 61-63). Further, the foams have a plurality of closed cells substantially uniformly distributed therein (Reference Cha's claim 5).

With respect to the product-by-process claims 1-3, Applicant must show that the resultant article is patentably distinct from those taught by the reference.

With respect to claim 10-11, Cha lacks the specific teachings of the relative foam density, the compressive load of the foam at 50% compression. However, they are each believed to be either inherently disclosed, or an obvious optimization to one of ordinary skill in the art of microcellular sound proofing foams.

With respect to claim 12-15, Cha lacks an express teachings of the foam materials being a mixture of thermoplastic elastomer and non-elastomeric thermoplastic polymer, and the use of hydrated metal compound as flame retardant. The Examiner takes Official notice that using thermoplastic blends and hydrated metal compound are well known to one of ordinary skill in the art to make flame retardant microcellular polymer foams.

As such, in the absence of unexpected results, it would have been obvious to one of ordinary skill in the art to modify and optimize the processing conditions, the

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thermoplastic polymer, and flame retardant used in the invention of WO '573, motivated by the desire to obtain flame retardant microcellular foams viable for sound proofing application.

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. In addition, the following references are cited of interest for making flame retardant foams:

US 4542164 to Nishioka et al.

US 4698369 to Bell

US 5670102 to Perman et al.

It is noted that Perman's invention is directed to a method of making thermoplastic foamed articles using supercritical fluid (column 3, lines 22-45), and Perman teaches that various additives such as colorants, flame retardants, etc. may be added to the thermoplastic polymer (column 3, lines 46-59).

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Victor S Chang whose telephone number is 703-605-4296. The examiner can normally be reached on 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel H Morris can be reached on 703-308-2414. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

VSC

VSC

June 18, 2002

DANIEL ZIRKER  
PRIMARY EXAMINER  
GROUP ~~1300~~  
1700

*Daniel Zinker*